

DISCUSSION OF THE AMENDMENT

All the claims have been canceled and replaced with new Claims 19-30, drawn to a pneumatic tire. Claims 19-23 are supported by Claim 15, combined with Claims 1 and 3-6, respectively. Claims 24-28 are supported by Claim 16, combined with Claims 7, 9-11, and 14, respectively. Claims 29-30 are supported by Claim 17, combined with Claims 8 and 18 respectively.

No new matter is believed to have been added by the above amendment. Claims 19-30 are now pending in the application.

REMARKS

Applicants thank the Examiner for the courtesy extended to Applicants' attorney during the interview held February 5, 2008, in the above-identified application. During the interview, Applicants' attorney explained the presently-claimed invention and why it is patentable over the applied prior art, and discussed other issues raised in the Office Action. The discussion is summarized and expanded upon below.

Due to the length of the specification herein, Applicants will cite to the paragraph number of the published patent application (PG Pub) of the present application, i.e., US 2004/0089388, when discussing the application description, rather than to page and line of the specification as filed.

The various provisional rejections on the ground of nonstatutory obviousness-type double patenting over claims in copending Application No. 10/477,710 (copending application) in view of prior art, are respectfully traversed.

The Examiner finds that the Terminal Disclaimer filed with the previous response is ineffective to overcome the rejection since it does not include the provision required by 37 C.F.R. § 1.321(d)(3).

In reply, **submitted herewith** is a new terminal disclaimer, based on ¶ 14.27.07 in MPEP 1490, which is prescribed for joint research agreement situations for a pending patent application. Accordingly, it is respectfully requested that the provisional obviousness-type double patenting rejections be withdrawn.

The rejections of:

Claims 1 and 3-8 under 35 U.S.C. § 102(a/e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over, U.S. 6,479,160 (Tsai et al) or JP 63-8448 (JP '448); and

Claims 1 and 3-6 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over, JP 3-88837 (JP '837) or JP 7-331020 (JP '020), are all respectfully traversed.

All of the presently-pending claims are now drawn to a pneumatic tire, not subject to these rejections. Accordingly, it is respectfully requested that the rejections be withdrawn.

The rejections under 35 U.S.C. § 103(a) of:

Claims 1, 3-10 and 14-17 as unpatentable over U.S. 5,292,590 (Lin et al), taken in view of Tsai et al or JP '448, or JP '837, or JP '020, and

Claim 18 over the above combination of references, and further in view of at least one of U.S. 5,280,817 (Liu et al) and U.S. 5,879,488 (Weston et al), are all respectfully traversed.

While Lin et al discloses an innerliner formed from ethylene-vinyl alcohol polymer (EVOH), Lin et al does not disclose a modified EVOH, let alone the modified EVOH (C) of the present claims. As Applicants' attorney submitted during the above-referenced interview, while EVOHs may have been modified with epoxy compounds for various reasons in the prior art, it is only with the present disclosure as a guide that such a modified EVOH would be used for the innerliner of Lin et al.

The pneumatic tire of the present invention uses an innerliner made of a modified ethylene-vinyl alcohol copolymer obtained by reacting a monofunctional epoxy compound. The problem of using unmodified EVOH for the innerliner is described in the specification at [0006]:

Use of a normal EVOH as an innerliner results in a great effect of improving the internal pressure retainability. However, the normal EVOH has an elastic modulus extremely higher than those of rubbers usually used for tires. Therefore, a rupture or crack may be generated in the innerliner due to its deformation caused by its flexure. For such reasons, when an innerliner made of EVOH is used, although the internal pressure

retainability of a tire before use is greatly improved, the internal pressure retainability of a tire after use, which was applied with flexural deformation during the rotation of the tire, may be worsened than that before use.

The present invention is directed to addressing these problems. Thus, as described in the specification at [0008]-[0009]:

An object of the present invention is to provide an innerliner for pneumatic tires which is superior in gas barrier property and flexing resistance. Another object of the present invention is to provide a pneumatic tire having greatly improved internal pressure retainabilities before and after driving through an improvement of the internal pressure retaining technology such as an innerliner.

Therefore, in the present invention, the object of modification with epoxy compounds is to obtain improved flexing resistance. A preferred embodiment employs monofunctional epoxy compounds, as now required by the present claims, the advantages of which are described in the specification at [0037]:

The epoxy compound (B) for use in the present invention is not particularly restricted, but it preferably is a monofunctional epoxy compound. If the epoxy compound (B) is an epoxy compound with two or more functionalities, a crosslinking reaction with the ethylene-vinyl alcohol copolymer (A) may occur to deteriorate the quality of the innerliner for pneumatic tires due to generation of gels, pimples and the like.

The specification herein contains comparative data which shows superiority of the present invention compared to the unmodified EVOH of the prior art, as noted by Applicants' attorney during the interview. Compare any of Examples 1-6 to Comparative Example 2, and the data in Table 1. While the Examples and Comparative Example 2 had good internal pressure retainability before driving, cracks were formed in the innerliner after drum driving and internal pressure retainability was extremely reduced after driving, for Comparative Example 2, as described at paragraph [0146]. In the Examples, on the other hand, internal pressure retainability was essentially maintained, while no cracks were formed.

Tsai et al discloses an oxygen barrier film comprising a resin composition obtained by reacting, for example, an EVOH and, as an oxygen scavenger, an epoxy functional polybutadiene. There is no disclosure or suggestion regarding a pneumatic tire, let alone about improving the flexing resistance.

JP '448 discloses a resin composition comprising a vinyl alcohol resin and a compound having a functional group (such as epoxy group) capable of being added to a hydroxyl group in the resin and having an allyl group, the compound being incorporated in the vinyl alcohol resin. The purpose of using such epoxy compounds is to improve water resistance by crosslinking of allyl groups, as stated:

When the thus-prepared monolayer or laminated molded article is cured in the air, allyl ether groups in the resin are further crosslinked internally. Therefore, the intended purpose, namely the improvement in water resistance, can be attained. (Page 15 line 24 to page 16 line 3 in the English translation.)”

There is no description about improving the flexing resistance or use in a pneumatic tire.

JP '837 discloses a resin composition comprising an EVOH and epoxy group-containing olefin-based copolymer. The olefin-based copolymer has an epoxy group equivalent of 700-10000 (see English abstract). According to the Japanese specification, “epoxy group equivalent” means the grams of the resin containing 1 gram of epoxy group. Therefore, the olefin-based copolymer may contain many epoxy groups in one molecule. JP '837 does not disclose a monofunctional epoxy compound, whose advantages have been discussed above.

JP '020 discloses a graft copolymer and EVOH. The graft copolymer is obtained by copolymerizing 1-100 mass% of monomer having oxirane ring and 99-0 mass % of other monomer (see English abstract). Therefore, the graft copolymer may contain many epoxy

groups in one molecule. JP '020 does not disclose a monofunctional epoxy compound, whose advantages have been discussed above.

In sum, and as Applicants' attorney pointed out during the interview, none of Tsai et al or JP '448, or JP '837, or JP '020, alone or in any combination, provide any motivation to modify the EVOH of Lin et al. No *prima facie* case of obviousness has been made out. Nor do Liu et al and Weston et al remedy any of the deficiencies in the combination of the remaining prior art.

For all the above reasons, it is respectfully requested that these rejections be withdrawn.

All of the presently-pending and active claims in this application are now believed to be in immediate condition for allowance. The Examiner is respectfully requested to now examine the nonelected species, and in the absence of further grounds of rejection, pass this application to issue with all pending claims.

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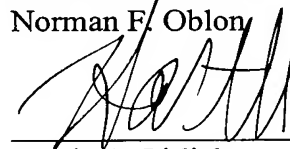
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